

## **Workshop 4 The Sustainable Space Explorer**

**Core STEM:** ENGINEERING, TECHNOLOGY

**Core Subjects:** SCIENCE, MATHS, ELECTRONICS, CIRCUITS, SCIENCE, SUSTAINABILITY, RENEWABLE ENERGIES

**Activity:** Building your own wind turbine.

**General description:** Building on the previous workshop, students will learn to harvest energy from the wind by building their own wind turbine and learning about how the shape and size of the blades impacts energy generation.

**Parts:**

**PART 1)** Students will explore electromagnetism and energy generation as a means to understand how brushed and brushless motors generate electricity. Solar energy production would be explained.

**PART 2)** Students will build a circuit that includes a DC motor as the base of their wind turbine and will attempt to light an LED.

**PART 3)** Using the scientific approach, students will explore how changes in the shape, size, number and orientation of the blades of the wind turbine affects the voltage generated. Students will compete to produce the most efficient turbine, and they will learn how to use a voltmeter to measure electric voltage.

**Space Theme Rationale:** Sustainable energy generation is necessary not only to ensure our future in earth, but also to be able to establish space outpost in other planets. Exploring different sources of energy generation will allow future space explores to carry less fuel and ensure their survival during missions in other planets or the moon.

**Core Concepts:** Energy and Forces, Magnetism and Electricity, Properties of Materials

**Core Skills:** Working Scientifically, Designing and Making

**Strands:** Materials, Energy and Forces, Environmental Awareness